

STAT

Santa Barbara, Calif. about 5 months ago. They lost a lot of people and they are still feeling the effects of the move.

[redacted] designed a new Photo interpreter's slide rule and [redacted] asked me to try to pick up some information on it. [redacted] calls this rule the High Altitude, Long Distance Photo Interpreter's Rule and he turned the design over to [redacted] about 6 months ago for production.

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The rule covers a tremendous range from on the deck to the moon. It has 5 log cycles running from 1.6 N. Mi. to 203,000 N. Mi. altitude. The attached special instructions from [redacted] describe the various scales.

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The rule will be the same size as the [redacted] N4ES log log rule, 10" long scales and 2" wide body. On the reverse side will be a set of standard scales from the N4Es rule:

- Top--- LLO, LL1, A, DF,
- Slider- Cf, CIF, T, S, L, C,
- Bottom- D, DI, K, LL2, LL3

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They make the rules by a photo etch process. They compute the distance to each mark and engrave the marks with a measuring engine on a glass master. They make a contact print of the Glass master onto the aluminum body of the rule under vacuum and then photo etch the marks into the body. This process requires no drawings or illustrations of the rule so none are available.

They expect to have production samples available in about 90 days. At that time they will also make prints of the master on velox cardboard which could be used for evaluation. The price of the rules has not been established but will be in the range of \$30 to \$35.

Let me know if you need any more information. If I'll keep track of when they start production and see if we can get a velox sample.

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Index marks STAT

5/25/64  
1 of 4*I* Special Instructions

Scale 1: runs from 1.645 n. mi. to 203,000. *Extend scale to 250,000 n. mi.*  
 Index marks at 19,300 marked 24 HR. SYNCH SAT. →  
 and at 203,000 marked MOON →, scale should be  
 named at top end altitude (n. mi.). (caps) ALT (n. mi.)  
 The index marks and names should be printed in red. OK

Scale 2: runs 10,000 ft. to  $10^9$  feet.

Scale should go to 1,000,000 feet with all zeros  
 printed. Next log cycle should be marked as

shown, 2, 3, 4, 5, 6, 7, 8, 9,  $10^7$

next log cycle 2, 3 -----  $10^8$

& " " " 2, 3 -----  $10^9$

Scale should be titled altitude (feet). (caps) ALT (FT.)

Scale 3 : Titled focal length (inches). (caps) FOCAL LENGTH (IN.)  
 from 1 to 30,000 (all <sup>zeros</sup> numbers printed out)

Besides usual numbering, add 12, 24, 36, 48, 72, 96

At 12, index mark ← SCALE (in red)

At 1, index mark ← FT/INCH.

At 5400, index mark ← LO-ALT.  
 LUNAR SAT.

At 25,000, index mark ← LO-ALT.  
 EARTH SAT.

At (calculated) setting of 81,120 inches, put on

index mark ← SECONDS  
 OF ARC

All index marks and legends are to be printed in red.

All scales: All index marks & names in red

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4 of 4

Scale 4 : Note that this is an inverted scale. *PRINT RIGHT SIDE UP*

Title it RESOLUTION (LINES/MM.)

*RES. (LINES/mm.)*

Print all numbers in red for this scale.

Scale 5: Print  $10^{-6}$ ,  $10^{-5}$ ,  $10^{-4}$  as shown, and when scale

gets to .001 foot <sup>of layer</sup> use full decimal printout. *IMAGE SIZE (FT.)*

Scale 6: Print out all zeros. *this IMAGE SIZE (CENTIMETERS) terminate at 4 cm. (beyond baseline)*

Scale 7: Print index mark ← *IMAGE SPEED (IN./SEC.)*

*(Red)*

at 4.75 feet on this scale.

Print in red.

*this index mark*

*GROUND SIZE (FT.)*

*Scales.*

*GROUND SIZE (N.M.I.)*

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Instructions to be printed on the rule, (preferably on the right stator), or cemented to back of case.

1. Set lens f.l. altitude or distance (in either ft. or n. mi.).

Read scale, ft./inch (or n. mi./inch), opposite their index marks. Opposite image size (in cms. or ft.) read corresponding ground size in feet.

2. To get angular size of object from a given distance, set the arc sec. index mark opposite the distance. Then, opposite the object size (on ft. scale) read size in sec of arc, on image size (cm.) scale.

3. To get image speed, first determine scale. Then set vehicle speed in ft./sec. (on the focal length scale) opposite the scale value. At the image speed index mark read the image speed (inches/sec) on the cm. scale. note index marks for earth and lunar satellite speed.

4. Set f.l. opposite altitude. Opposite a given ground dimension, read equivalent resolution in lines/mm. on resolution scale.

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3 of 4III 0 level numbers for each scale

(i.e., numbers on a parallel cut at bottom of scale)

Scale 1	--	1.645 n. mi.
Scale 2	--	10,000 ft.
Scale 3	--	1 inch
Scale 4	--	3937 lines/mm. (extend to 4000, below line)
Scale 5	--	$8.3 \times 10^{-7}$ ft.
Scale 6	--	.0000254 cm.
Scale 7	--	0.1 ft.
Scale 8	--	partial scale. Starts parallel with 608 ft. on #7, at 0.1 n. mile.

*goes to 2 n. mi.*

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